

CHAIR REPORT ON THE STOCK ASSESSMENT REVIEW

COMMITTEE MEETING (SARC 37)

JUNE 16–20, 2003

NEW BEDFORD, MASSACHUSETTS

Prepared by

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for

**University of Miami
Independent System for Peer Review**

5 July 2003

EXECUTIVE SUMMARY

Four stock assessments and a paper on a developing fishery were presented to the 37th Stock Assessment Review Committee (SARC) meeting from June 16-20, 2003. The assessments considered and the years when they were last assessed were: witch flounder (1999), spiny dogfish (1997), illex squid (1999), and Atlantic surfclam (1999). The developing fishery discussed was Atlantic hagfish.

Before the meeting, as a new SARC Chair, I was brought up to speed on the process, and my role in the process, by the Stock Assessment Workshop (SAW) Chair (Terry Smith). The Northeast scientists have a great deal of experience with the SAW/SARC process and the 37th SARC meeting was completed on schedule with few problems. The Advisory Report (which contains the management advice regarding the assessed stocks) was compiled and edited after the meeting and its production is on schedule for the first Public Review Workshop (July 15-17, 2003).

The SARC process is sound and successful. However, there is a difficulty in common with other stock assessment processes throughout the world: not enough highly skilled quantitative stock assessment scientists with sufficient time to meet the demand for “cutting edge” stock assessments. This problem can lead to “hurried” assessments using methods that have not been fully developed or thoroughly tested. In the illex squid assessment an innovative approach was taken, which was commended by the Panel, but the conceptual methods were not correctly implemented. In the spiny dogfish assessment the approach taken was far from standard and the methods used are questionable (although the assessment results are reasonable).

A solution to this problem is to aim to deliver timely stock assessments using only established and thoroughly tested methods. That is, the needs of management are serviced by routine updates of assessments involving the addition of new data but no change in methods (or software). In a separate process new and improved methods can be developed and thoroughly tested without the pressures of a strenuous stock assessment timetable.

SUMMARY OF MEETING

The 37th SARC meeting was held at the School for Marine Science and Technology (SMAST) in New Bedford, Massachusetts from June 16-20, 2003. Four stock assessments and a paper on a developing fishery were considered by a Panel of 13 including the CIE appointed Chair (myself) and a CIE reviewer (Paul Medley). The assessment documents and background papers were distributed (electronically) to the Panel and other meeting participants about two weeks prior to the meeting. The scientific staff who were the major contributors to the papers made Powerpoint presentations to the meeting. The discussion of the papers involved not only the Panel, but the presenters and members of their team, various observers (including several from the fishing industry), and the SAW Chair (Terry Smith) and the chief of the stock assessment group at the NMFS lab in Woods Hole (Steve Murawski).

The assessments considered and the years when they were last assessed were: witch flounder (1999), spiny dogfish (1997), illex squid (1999), and Atlantic surfclam (1999). A paper on the developing fishery for Atlantic hagfish was also discussed. The meeting started on Monday afternoon (16 June) with the presentation and discussion of the witch flounder assessment. On

Tuesday, spiny dogfish and hagfish were discussed, with illex squid and Atlantic surfclam dealt with on Wednesday. On Thursday and Friday analyses requested by the Panel earlier in the week were presented, draft Advisory Reports, rapporteur's reports, and research recommendations were discussed and reports were revised. The focus on the last two days was to obtain agreed wording on the crucial sections of the Advisory Reports (those sections being: "State of the stock", "Management advice" and "Special comments").

The four assessments used a variety of assessment methods and typically presented an alternative assessment in addition to the assessment used to provide management advice.

The witch flounder assessment was primarily from a VPA, but an alternative "statistical catch-at-age" model was also presented. It was found that over-fishing was occurring but that the stock was not overfished. One interesting feature of both assessments was the domed nature of an apparent stock-recruitment relationship. The best recruitment was estimated to have occurred at the lowest levels of spawning biomass – not a feature stressed by the Panel.

There are insufficient age data for a VPA to be contemplated for spiny dogfish. A length-based model was used in the assessment in conjunction with some unusual modelling assumptions. The trawl survey time series of biomass was assumed to provide an absolute abundance index (after being "smoothed" using a three-year moving average). The trawl survey selectivity was assumed to be independent of length, age, and sex. The commercial selectivity was estimated each year relative to the trawl survey length frequency after "smoothing" the commercial length frequencies using a three-year moving average. Reference points were all based on female exploitable biomass. The stock was assessed as overfished but overfishing was not occurring (although the estimated F on females was well above the rebuilding target, it was just below the threshold value). The main feature of this assessment is that the seven most recent estimated recruitments are the lowest on record.

The hagfish paper was comprehensive in terms of describing the current knowledge of hagfish biology and fisheries. The Working Group had a range of recommendations for research to improve the state of knowledge to a level that would enable a quantitative stock assessment. Mainly, the SARC agreed with the Working Group but wanted a more narrowly focused approach, with main priorities to extend knowledge of the biology and to obtain fishery dependent data (e.g., port sampling and CPUE indices).

The illex squid assessment contained some innovative modelling approaches but the models were considered preliminary and did not substantially influence management advice. Some Panel members (specifically the CIE participants) were concerned that the models were not properly formulated or fitted. However, the whole Panel was supportive of the general approach taken and recommended further development of the models. Illex squid live less than a year and so are very difficult to assess. The U.S. fishery appears to have limited access to the stock and it was concluded that the stock was unlikely to have been overfished in recent years.

Atlantic surfclams were assessed in two ways. The primary method used absolute biomass estimates from efficiency-adjusted dredge surveys. An alternative assessment used a biomass dynamics model applied to some of the sub-stocks (defined by area). The model results were considered unreliable, because of residual patterns and an observed "bias" in the estimators obtained from a bootstrap analysis. From the dredge surveys, it was concluded that the stock (it is managed as a single stock) was not overfished and overfishing was not occurring.

VIEWS ON THE MEETING PROCESS

This was the 37th SARC and it was apparent that the NEFSC has had a good deal of experience at organizing and running these meetings. Several of the participants were SARC veterans and their participation was particularly helpful.

Meeting Process

Before presenting my views on the meeting process, I need to describe in more detail the general process, the participants, and the process of this particular meeting.

The SARC meeting is part of a larger Stock Assessment Workshop (SAW) process. It provides the final peer review of stock assessments and produces the Advisory Report that contains management advice for individual stocks in terms of their Fishery Management Plans. Participants in the SARC meeting are: the SARC (or Panel), including the CIE appointed Chair and a CIE reviewer; the SAW Chair; the stock assessment presenters and their teams; and various interested parties such as SAW Working Group Chairs and industry stakeholders.

One of the responsibilities of the SARC Chair is to appoint, from within the Panel, SARC Leaders for each species. Their main responsibility is to oversee the production of the draft Advisory Report and rapporteur's report for their species. The rapporteurs are members of the species presentation teams, and they produce the first drafts of the Advisory Report and record the discussions of the meeting in the rapporteur's report. The latter are included in the SARC Consensus Summary (a volume of several hundred pages that consists mainly of revised versions of the papers presented to the SARC).

During the first three days of the meeting, species presentations were worked through as per the agenda. For each species, the presentations were interrupted only for questions of clarification, then specific questions were asked and, subsequently, there was a final general discussion. The aim of the discussion was to establish a consensus on any points of contention. It was my intention, as Chair, that at the end of the discussion, the meeting had a good sense of what the state of the stock was and what management advice would be given. I also made a point of formally noting that we were accepting the assessment (there is provision for assessments to be rejected by the Panel).

On the final two days, the draft Advisory Reports and rapporteurs' reports were considered. These were edited in real time by the meeting with the revisions visible to the meeting via the projection system. The first species (witch flounder) was very slow going as we worked through each paragraph of the reports. For subsequent species, I limited the in-meeting editing primarily to the three most important sections of the Advisory Report: "State of the stock", "Management Advice", and "Special Comments". Editorial suggestions for other sections of the Advisory Report and the rapporteur's report were requested to be sent by email; only "major" issues for the other sections were considered at the meeting (e.g., research recommendations to be inserted or deleted).

At the end of the meeting we had reached agreement, for most species, on the wording of the three "main" sections of the Advisory Reports and, for the others, had the "sense" of the meeting if not the exact wording. As this report is being written, the final editing of the Advisory Reports

is also being done. A near-final draft of the collected reports is to be sent to the Panel for comment and then as the SARC Chair I will do the final editing in response to their suggestions.

The structure of the process appears sound. The roles and responsibilities of the participants are sensible and well linked. The crucial factors in making the process work are the skills and experience of the participants. As a first time Chair of a SARC, it was important that I had an experienced SAW Chair to advise me on process. For the success of the meeting it was also important that there were several SARC veterans present. They have experience in identifying key issues and crafting appropriate wording. I think that this meeting had a good mix of skills and experience.

In terms of process, the most difficult aspect of the meeting was agreeing on the wording in the Advisory Reports. The rapporteurs (presumably assisted by the assessment scientist) provide a first draft (checked and/or edited by the SARC Leader), which is then edited in real-time via the projection screen (after people have had a chance to read it). The real-time editing involves people suggesting wording to the editor (SAW Chair in our case) either verbally, or in writing should some crafting be necessary. There was of course some discussion on the appropriateness of particular words and phrasing. This process can be very time consuming, and the larger the group involved the more time it is likely to take.

As mentioned above, after the experience with witch flounder, I restricted the real-time editing to the three most contentious sections of the Advisory Report. The meeting must necessarily agree on some wording, but perhaps the need could be reduced somewhat. One possibility would be to limit some sections of the Advisory Report to a very prescriptive “check list”, e.g., check the boxes for “overfished”, “overfishing”, or not, and provide management advice by checking one of several predefined alternatives tailored to the specific Fishery Management Plan. There will still be the need for qualifying comments as in the “Special Comments” section, but if it can reduce the amount of wording that needs to be agreed upon, it might be an approach worth considering.

Outcomes of the Meeting

One of the crucial roles in terms of delivering quality outputs from the meeting is that of the rapporteurs. If, with the help of the SARC Leader, they capture the “sense” of the meeting in their first draft of the Advisory Report and the rapporteur’s report, in concise and well-written English, then real-time editing will proceed quickly. If they are not able to do this then the quality of the reports is potentially compromised, due to insufficient time, and the intrinsic difficulty of crafting words by “committee”.

Ideally, there would be one highly skilled and experienced rapporteur for the whole meeting, but lack of stamina would preclude almost everyone from such a role. Alternatively, if all the SARC Leaders were equally gifted, they could make up for any deficiencies in the rapporteurs. In terms of ensuring that good first drafts are placed before the meeting, it would be advisable to limit the number of rapporteurs, perhaps to just two, and to use people who have previous experience and appropriate skills. It might also be advisable to filter the first drafts through an experienced editor/SARC veteran before they go to the full meeting.

Materials provided

The meeting documents (Appendix 2) were provided in a timely fashion, about two weeks before the meeting through a website. At the meeting venue participants were given access to a server that contained the main meeting documents and that was used to distribute draft Advisory Reports and other draft documents. Hard copies were also made available during the meeting. This process worked well.

The meeting documents were all well written, contained relevant material, and were generally of a high standard. Two minor complaints: some documents did not contain an “Executive Summary”, and some documents contained far more figures and/or tables than were necessary.

Guidance provided to the Chair

I received a great deal of help from Terry Smith prior to and during the meeting in terms of the overall process, the objectives of the meeting, and my role as chair in the process. We exchanged several emails prior to the meeting to make sure that I understood the process, my role and responsibilities. Terry also provided a document (Anon. 2001) giving background on the process and the roles and responsibilities of the various participants (e.g., SARC Leaders, presenters, and rapporteurs). Other SARC veterans also provided me with some useful advice.

There is very little room for improvement here. My only suggestion is that the background document be provided as part of the first communication with a new SARC Chair. This would bring them up to speed most quickly and lessen the need for the new Chair to ask the “right questions”.

OTHER OBSERVATIONS ON THE MEETING PROCESS

The proper functioning of the meeting required help from computer support staff at SMAST. The staff was very helpful and problems encountered were efficiently solved. The use of the server for providing electronic documents worked well. I have only one suggestion. In hindsight, we could have put more care into structuring the server directory into sub directories (e.g., it proved a bit frustrating finding the latest drafts of “illex” documents as the file naming system became somewhat lax – if the files had all been in an “illex” directory it would have been much easier).

There is a major issue with stock assessment processes worldwide. There is a shortage of skilled and experienced stock assessment scientists, and there are ever increasing demands on them to produce more and better stock assessments. I saw in this meeting two of the products of this problem. First, staff had clearly had to rush some of the work they had done. Also, they had endeavored to use new and innovative approaches in their assessments (and some mistakes were made). This is not a criticism of the staff; it is a consequence of the process. They want to use the “best” methods, but they do not have the time to fully develop and properly test the methods before using them in an actual assessment.

There is a solution to this problem but, because it requires a shift in culture, it will be slow to happen (if it ever does). The solution is to use the skills of the experienced staff more efficiently. Those that are able should be involved in method development outside of a stock assessment

process. That is, there should be two processes: a routine stock assessment process using “standard and approved” methods; and an asynchronous process where new methods are developed and tested (so that they eventually become “standard and approved”). The staff performing routine stock assessments does not need to be highly trained. Innovative and highly trained staff can develop new methods.

This is not a new idea, and I am not the originator of the idea. Certainly, many people have come to this conclusion in different parts of the world, but the solution has never really been fully implemented anywhere. There are places where the use of “standard and approved” methods is encouraged, but the stock assessments often are not “standard”. There are generally attempts to “improve” on some aspect of the assessment rather than simply “turning the handle” with the only change being the addition of new data. I am not against improvement in assessments, but the desire to supply assessments using “cutting edge” methods often leads to rushed assessments using methods that are not fully tested and that may be in error or wrongly implemented.

COMMENTS ON ASSESSMENT METHODS

I have several comments on the assessment methods used in the witch flounder, spiny dogfish, illex squid, and surfclam assessments. As SARC Chair I had to maintain a relatively neutral stance on the methods used as decisions on their applicability and correctness were for the Panel as a whole. However, you will see below that I do have some major concerns.

Witch flounder

A “standard and approved” VPA was used to provide the management advice, but an alternative “statistical catch-at-age” model assessment was also done. I am aware that there is a plan to move towards providing alternative assessments to the traditional VPA. I think that this is a good idea and the witch flounder assessment is a good example of the benefits of doing this.

One issue came up during the discussion of this assessment that concerned me. The notion that a “bad” retrospective pattern is indicative of a statistical bias in an estimator seems to be prevalent amongst fisheries researchers. In the case of VPAs, it has been established that they can be significantly biased in the more recent years with an overestimation of biomass and an underestimation of fishing mortality (e.g., Myers & Cadigan 1995). This has been established by simulations using an operating model; it does not follow from retrospective analysis. A retrospective analysis is concerned with the *single* realization of a random vector, and examines the estimates derived from sub-vectors. It cannot in general reveal anything about statistical properties of the associated estimator. It may be that the problem of bias is so bad for VPAs that a “sample of one” from a retrospective analysis is indicative of a bias, but I am not aware of any proven theory supporting this view.

In the case of “statistical catch-at-age” models retrospective patterns cannot accurately predict anything about the properties of the associated estimator. That is not to say that retrospective analysis is not useful, but it reveals only how estimates change in response to data, and does not reveal statistical properties of estimators.

Spiny dogfish

I liked many aspects of the supporting analysis done in this assessment and I think that the assessment results and subsequent management advice are reasonable. However, I believe that several aspects of the methods used in this assessment are questionable. My specific concerns are:

- The use of trawl survey swept-area biomass estimates as indices of *absolute* abundance.
- The assumption of a length, age, and sex independent selection pattern for the trawl survey gear.
- The estimation of fishing mortality rates using catch to biomass ratios.
- The specification of a discard “fishing mortality” independent of the processes generating the discards.
- Using three-year moving averages of length frequencies and biomass in the analysis.

The data available for this assessment cannot be used in a VPA because there are inadequate catch-at-age estimates. However, the available data could be used in a number of standard estimation procedures that can use length data (e.g., Stock Synthesis, Methot 2000). Instead of using a standard approach, a completely new method has been developed that relies on using a trawl survey time series to provide absolute abundance indices. The assumption of a known trawl survey proportionality constant (q) can lead to extreme inaccuracy in assessment estimates and a gross understatement of their uncertainty. There are three unknown components in a trawl q : areal availability, vertical availability, and vulnerability (see, for example, Cordue 1996). While there may be some well-founded confidence that areal availability is perhaps greater than 80%, and vertical availability is not too low, I cannot see how very much at all is known about what proportion of spiny dogfish in front of the wings are caught. The assumption of no selection pattern in the trawl survey gear is equally unsupportable in my opinion and, like the absolute biomass assumption, it is unnecessary in this case.

Various “types” of fishing mortality are defined in the analysis, but the estimates are all in terms of catch to biomass ratios, whereas the objects being estimated are described as “fishing mortality rates”. I interpret the latter to mean *instantaneous* fishing mortality rates. (There is a similar confusion of terminology in the surfclam assessment.)

A “discard” mortality rate is defined independently of the “fishing” mortality rate. But discards are a function of fishing. That is, fishing gets them out of the water, then a proportion are discarded by being returned to the water, some proportion of which survive. The proper way to deal with discards is to modify the (Baranov) catch equation for each “fishery” incorporating the discard rate and survival rate.

The use of three-year moving averages was justified in terms of the long-lived nature of spiny dogfish (about 50 years) and the fact that the indices were too noisy, in their raw form, to properly reflect biological processes. However, if fishing mortality is high (as was estimated in some years) then it is unreasonable to assume that biomass and length frequencies are constant over a 3-year period.

Illex squid

Some innovative work was done in this assessment in terms of a maturity-mortality model and an in-season assessment model. Unfortunately, not enough attention was paid to the definition of the

processes that were being modeled and the equations appeared to contain errors and inconsistencies. The new models were not used in the assessment in any quantitative way so these problems were not discussed in the meeting in any depth.

I will not go into the equations in any detail, as I believe that Paul Medley has done so in his CIE report, but I will cover some general points.

In the maturity-mortality model there are two classes of squid: immature and mature. The number of squid in each class is recorded in weekly time steps. Natural mortality is occurring in continuous time, possibly at different rates for the two maturity classes, and at some stage each week there is a maturation event when some proportion of immature squid become mature. The problem with the equations in the draft document is that there is no specific accounting for when the maturation event occurs. The correct equations differ depending on whether it is at the beginning, middle, or end of the week. The equations in the text appear to make those immature squid which mature (during the week) exempt from natural mortality.

In forming the likelihood for the maturity-mortality model a binomial distribution is assumed to underlie the maturity proportions and an independent multinomial distribution is assumed for the proportions at age. However, no details of the sampling procedures are given. It is imperative that the sampling procedures be fully described and properly modeled. Certainly a squid is either mature or not, but it does not follow that a binomial distribution should be used in the likelihood, or if it is, that the effective sample size should be equal to the number of squid of age t weeks. It is certainly not clear that the Bernoulli trials (is this squid mature or not?) are independent of each other when the samples may be from the same trawl. The justification for the multinomial distribution and the effective sample sizes are equally problematic since squid school by size and/or age. It is also not clear that the binomial and multinomial distributions should be assumed to be independent of each other.

Surfclams

Two interesting points arose during the discussion of this assessment. The primary assessment was from the efficiency adjusted swept-area dredge estimates. The Working Group and the SARC accepted the annual estimates of dredge efficiency despite the data appearing to be unable to reject the hypothesis of constant dredge efficiency (for the three most recent surveys: 1997, 1999, 2002). In hindsight, I believe that there should have been a sensitivity test done to the assumption of constant dredge efficiency. It is a plausible assumption (I don't believe that any gear parameters were changed over the three years) and it changes the relative trend over the surveys:

	1997	1999	2002
Annual efficiency:	1.00	1.27	0.70
Constant efficiency:	1.00	0.76	0.56

The second point concerns the basis for rejecting, and classing as unreliable, some of the KLAMZ model results. One of the main concerns seemed to be that the estimators were "biased" as demonstrated from bootstrapping. Although better than retrospective analysis about revealing estimator properties, bootstrapping is still of little use. The problem is that a bootstrap distribution only reveals the properties of the estimator at the estimate (assuming that the estimation model reflects "reality"). It reveals nothing about the estimation properties at other points in the parameter space, except perhaps those very close to the estimate. Now, of course, we would ideally want to have a good estimator in the vicinity of the "true" parameter value. But, if this is

accepted, then to reject an estimate on the basis of estimator “bias” within the vicinity of the *estimate* is illogical. If the estimate is near to the true value, then whether the estimator is biased or not is of no consequence, we should use the estimate. If the estimate is not near the true value, then the bootstrap estimate of bias does not reveal whether the estimator is biased or not near the “true” value.

If that argument is too esoteric, consider an estimator that always produces the same parameter estimate. A bootstrap analysis would reveal the perfect estimator: no bias and no variance. Incidentally, it would also have the perfect retrospective pattern.

RECOMMENDATIONS

The SARC process is sound and successful. However, I believe that there is room for some improvement in the process, especially if one had a view to a possible change of process in the future.

Within the current process, I suggest that:

- The presentation of multiple assessments using alternative methods be supported.
- The use of “standard” and “approved” assessment methods be encouraged.
- Consideration be given to ways in which the real-time editing of draft reports during the meeting can be kept to a minimum.

I suggest a move in the medium to long term to a new process whereby:

- Stock assessments are updated in a routine and timely manner using fully tested and “approved” methods and software.
- New and improved methods and software are developed and tested in a separate and asynchronous process.

REFERENCES

- Anon. 2001: Northeast Regional Stock Assessment Workshops. Northeast Fisheries Science Center, Woods Hole, Massachusetts.
- Cordue, P.L. 1996: A model based method for bounding virgin biomass using a catch history, relative abundance indices, and ancillary information. New Zealand Fisheries Assessment Research Document 96/8. 48 p.
- Methot R. D. 2000: Technical description of the stock synthesis assessment program. U.S. Dept. Commer., NMFS-NWFSC-43. 46 p.
- Myers, R.A., and Cadigan, N.G. 1995: Statistical analysis of catch at age data with correlated errors. Can. J. Fish. Aquat. Sci. 52: 1265–1273.

APPENDIX 1: STATEMENT OF TASK

Consulting Agreement between the University of Miami and Patrick Cordue

May 23, 2003

General

The Stock Assessment Review Committee meeting (SARC) is a formal, one-week long meeting of a group of stock assessment experts who serve as a peer-review panel for several tabled stock assessments. It is part of the overall Northeast Stock Assessment Workshop (SAW) process which also includes peer assessment development (SAW Working Groups), public presentations, and document publication within a cycle that lasts six months. The panel is made up of some 12-15 assessment scientists: 4 scientists from the NEFSC; a scientist from the Northeast Regional office, scientists from the staff of the New England and Mid-Atlantic Fishery Management Councils, and Atlantic States Marine Fisheries Commission and additional panelists from state fisheries agencies, academia (US and Canada), and other federal research institutions (US and Canada).

Designee will serve as chairman of the 37th Stock Assessment Review Committee panel. The panel will convene at the School for Marine Science and Technology, University of Massachusetts, Dartmouth the week of 16 June 2003 (16-20 June) to review assessments for Atlantic surfclam (*Spisula solidissima*), northern short-finned squid (*Illex illecebrosus*), witch flounder or grey sole (*Glyptocephalus cynoglossus*), and spiny dogfish (*Squalus acanthias*). The panel will also be asked to comment on a working paper discussing approaches to assessing Atlantic hagfish (*Myxine glutinosa*), a developing fishery with little or no fishery-independent and fishery-dependent information.

Specific

- (1) Prior to the meeting: become familiar with the working papers produced by the SAW Working Groups (total number not final; there will be at least one per stock);
- (2) During the meeting: Act as chairperson where duties include control of the meeting, coordination of presentations and discussion, control of document flow;
- (3) After the meeting: Facilitate the preparation and writing of a Draft Advisory Report and Consensus Summary Report by NMFS personnel. Panelists, NEFSC staff and the

SAW Chairman will ensure that documents are made available to the SARC chair, revised according to the SARC Chair's directions, compiled, copied and distributed;

- (4) Review the final Draft Advisory Report and Consensus Summary Report.
- (5) No later than July 7, 2003, submit a written chair report¹ addressed to the "University of Miami Independent System for Peer Review," and sent to Dr. David Sampson, via email to David.Sampson@oregonstate.edu, and to Mr. Manoj Shrivani, via email to mshrivani@rsmas.miami.edu

The SAW Chairman and SAW Coordinator will assist the Chair prior to, during and after the meeting in ensuring that documents are distributed in a timely fashion. The SARC Chair will be solely responsible for the editorial content of the reports.

The Chair's duties will occupy a total of 17 days - several days prior to the meeting for document review; the week long meeting; several days following the meeting to ensure that the final documents are consistent with the SARC's recommendations and advice, and several days to complete the chair report.

Contact persons: Dr. Terrence P. Smith, NEFSC, Woods Hole, SAW Chairman, 508-495-2230

Mary Jane Smith, NEFSC, Woods Hole, SAW Coordinator, 508-495-2370

Signed _____

Date _____

¹ The written report will undergo an internal CIE review before it is considered final. After completion, the CIE will create a PDF version of the written report that will be submitted to NMFS and the consultant.

ANNEX I: Contents of Chair Report

1. Synopsis/summary of the meeting – to provide context for the comments rather than to rewrite the summary report, which is a product of the meeting, and is not a CIE product.
2. Views on the meeting process, including recommendations for improvements on:
 - The meeting process itself;
 - The outcome(s) of the meeting;
 - Materials provided for the meeting, including their timeliness, relevance, content, and quality;
 - The guidance provided to run the meeting.
3. Other observations on the meeting process.
4. Appendices, including:
 - Statement of Work;
 - Bibliography of the materials provided for the meeting;
 - Summary report (if available at the time of report submission).

APPENDIX 2: DOCUMENTS PROVIDED FOR THE MEETING

Documents were provided in hardcopy at the meeting venue and in electronic form prior to the meeting. There were species specific documents and two documents related to the SAW process and SAW/SARC 37 in particular. For the four species which had been previously been discussed at SARCs (i.e., not hagfish) the previous Advisory Reports and Consensus Summary Reports were made available in hardcopy at the meeting venue.

Witch Flounder

- A1. Witch Flounder Assessment. Northern Demersal Working Group.

Spiny Dogfish

- B1. Assessment of spiny dogfish (*squalus acanthias*) for 2002. Southern Demersal Working Group/ASMFC Spiny Dogfish Technical Committee.
- B2. Summary of research on spiny dogfish in North Carolina by East Carolina University, 1997 –2003. R.A. Rulifson 2003.
- B3. Biological characterization of the North Carolina spiny dogfish (*squalus acanthias*) fishery. Rulifson et al., 2002.
- B4. Characterization of the spiny dogfish population south Of Cape Hatteras for potential commercial harvest and Management Plan development. Newman et al., 2000.
- B5. Biological information on the Northern District spiny dogfish fishery needed for the Fishery Management Plan. Hickman et al., 2000.

Surfclams

- C1. Assessment of Atlantic surfclam. Invertebrate Subcommittee.

Illex Squid

- D1. Assessment of the northern shortfin squid stock in the Northwest Atlantic for 2002. Invertebrate Subcommittee.

Hagfish

- E1. Review of Atlantic hagfish biological and fishery information with assessment and research considerations. Ad Hoc Atlantic hagfish Working Group.

Process related documents

Anon. 2001: Northeast Regional Stock Assessment Workshops. Northeast Fisheries Science Center, Woods Hole, Massachusetts.

Smith, T. 2003: Announcement of 37th Northeast Regional Stock Assessment Workshop (37th SAW) and 37th Stock Assessment Review Committee Meeting (SARC).